

Risolve una disequazione alla volta.

$$\textcircled{1} \frac{2(x-3)^2 + 3x - 16}{2x-1} + 11 \geq \frac{(2x-4)(3x-9)}{6} - \frac{(x^2+6x)(2x+12)}{2x+12}$$

$$\frac{2(x-3)^2 + 3x - 16}{2x-1} + 11 \geq \frac{\cancel{2}(x-2) \cdot \cancel{3}(x-3)}{\cancel{6}} - \frac{x \cdot \cancel{(x+6)} \cdot \cancel{2}(x+6)}{\cancel{2}(x+6)}$$

$$\frac{2(x-3)^2 + 3x - 16}{2x-1} + 11 \geq (x-2)(x-3) - x(x+6) \quad \textcircled{x \neq 6}$$

$$\frac{2(x-3)^2 + 3x - 16}{2x-1} + 11 \geq \frac{x^2 - 2x - 3x + 6 - x^2 - 6x}{x+6} \rightarrow (x-5)$$

Faccio il denominatore comune

$$\frac{2(x-3)^2 + 3x - 16}{2x-1} \geq (x-5)(2x-1)$$

$$\frac{2(x^2 - 6x + 9) + 3x - 16}{2x-1} \geq 2x^2 - 10x - x + 5$$

$$\frac{\cancel{2x^2} - 12x + 18 + 3x - 16}{2x-1} \geq \cancel{2x^2} - 10x - x + 5$$

$$\frac{2x - 3}{2x-1} \geq 0$$

~~2x-1 > 0~~

$$\textcircled{9} \quad \frac{(x+1)^2 + x - 4}{4x+12} \leq \frac{x(x-2)}{6x-3} + \frac{2x^2+x+2}{24x-12}$$

$$\frac{(x+1)^2 + x - 4}{4(x+3)} \leq \frac{x(x-2)}{3(2x-1)} + \frac{2x^2+x+2}{12(2x-1)}$$

$$\frac{3(2x-1)[(x+1)^2 + x - 4] \leq 4(x+3) \cdot x(x-2) + (2x^2+x+2)(x+3)}{12(2x-1)(x+3)}$$

$$\frac{3(2x-1)[x^2+2x+1+x-4] \leq (x+3)[4x^2-8x+2x^2+x+2]}{12(2x-1)(x+3)}$$

$$\frac{6x-3}{3(2x-1)}(x^2+3x-3) \leq (x+3)(6x^2-7x+2)$$

$$\frac{6x^3+18x^2-18x-3x^2-9x+9 \leq 6x^3-7x^2+2x+18x^2-21x+6}{12(2x-1)(x+3)}$$

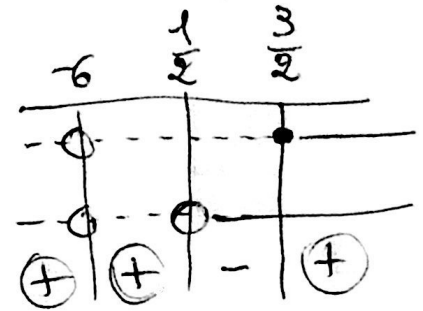
$$\frac{-27x-3x^2+9 \leq -7x^2-19x+6}{12(2x-1)(x+3)}$$

$$\frac{+14x^2-8x+3}{12(2x-1)(x+3)} \leq 0$$

Il sistema diventa

$$\begin{cases} \textcircled{1} \left\{ \begin{array}{l} \frac{2x-3}{2x-1} \geq 0 \quad x \neq -6 \\ \textcircled{2} \left\{ \begin{array}{l} \frac{4x^2-8x+3}{12(2x-1)(x+3)} \leq 0 \end{array} \right. \end{array} \right. \end{cases}$$

Studio il segno di ogni disequazione-frazione

$$\begin{aligned} \textcircled{1} \quad 2x-3 \geq 0 &\rightarrow x \geq \frac{3}{2} \\ 2x-1 > 0 &\rightarrow x > \frac{1}{2} \end{aligned}$$


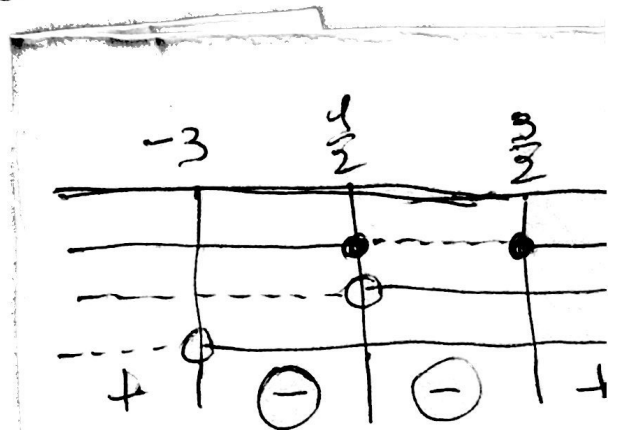
La soluzione è:

$$x < \frac{1}{2} \cup x \geq \frac{3}{2} \cup \{x \neq -6\}$$

$$\begin{aligned} \textcircled{2} \quad 4x^2-8x+3 &\geq 0 \\ \Delta &= 64-48=16 \\ x &\leq \frac{1}{2} \cup x \geq \frac{3}{2} \end{aligned}$$

$$x_{1,2} = \frac{8 \pm 4}{8} \begin{cases} \frac{4}{8} = \frac{1}{2} \\ \frac{12}{8} = \frac{3}{2} \end{cases}$$

$$\begin{aligned} 2x-1 > 0 &\rightarrow x > \frac{1}{2} \\ x+3 > 0 &\rightarrow x > -3 \end{aligned}$$

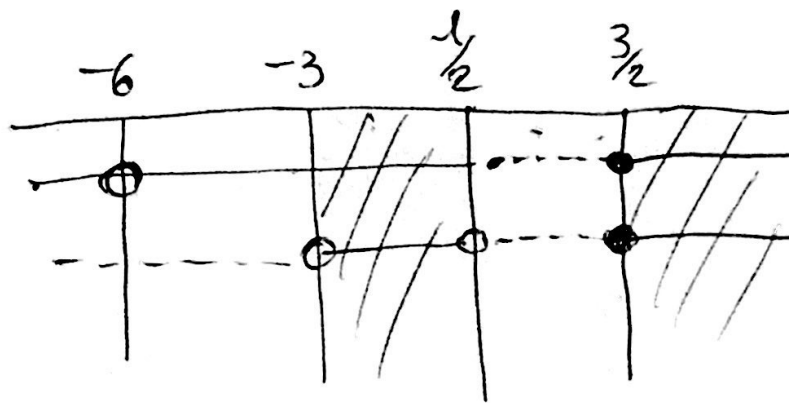


Soluzioni:

$$-3 < x \leq \frac{3}{2}$$

La soluzione del sistema è l'intersezione delle soluzioni

$$\left\{ \begin{array}{l} x \leq \frac{1}{2} \cup x \geq \frac{3}{2} \cup \{x \neq -6\} \\ -3 < x \leq \frac{3}{2} \end{array} \right.$$



La soluzione del sistema:

$$-3 < x < \frac{1}{2} \cup \left\{ x = \frac{3}{2} \right\}$$